extracted from the container 8 by a syringe for further processing. For example, the fibrinogen may be reconstituted and combined with thrombin to produce a sealant or an adhesive.

The apparatus of the invention may be used for other automated processes. For example, another technique for the separation of fibrinogen from blood in accordance with the structure of the invention uses cryoprecipitation. According to this technique, plasma is frozen to a temperature of about minus 20° C., thawed, and then centrifuged to separate the fibrinogen from plasma. The multiple-decanting apparatus of this invention may be used to automate cryoprecipitation by inclusion of a temperature control device 50 in thermal contact with the centrifuge. The temperature control device may comprise any of several known structures, including liquid nitrogen or liquid oxygen based devices and refrigeration devices.

To effect automated cryoprecipitation, a sample of blood is placed in the first chamber 8, and the container is then placed in the centrifuge and subjected to a first centrifugation. The plasma is then drained into the second chamber 8, for example by gravity draining. The temperature control device is then activated first to freeze the plasma and then to allow the plasma to thaw. The thawed plasma is subjected to a second centrifugation, which separates fibrinogen from the remainder of the plasma. The supernatant plasma is then separated from the fibrinogen by draining it back into the first chamber, for example by centrifugal draining, whereby only fibrinogen remains in the second chamber. The container is then removed from the centrifuge, and the fibrinogen removed from it for use as described above. Of course, the freeze-thaw-centrifuge process may be carded out any number of times before the supernatant is drained back into the first chamber.

Modifications within the scope of the appended claims will be apparent to those of skill in the art.

We claim:

1. A centrifuge comprising means for removably receiving a unitary container having a plurality of chambers for receiving substances to be centrifuged, means for rotating said container to subject said substances to centrifugation, and means for locking said container in a first predetermined position to allow a supernatant in a first of said chambers to transfer into a second of said chambers and for locking said container in a second position to transfer a supernatant in said second chamber to another of said chambers.

2. Apparatus according to claim 1 wherein said means for locking, when activated, locks said container such that a supernatant in one of said chambers transfers into another of said chambers by gravity draining.

3. Apparatus according to claim 1 wherein said means for locking, when activated, locks said container such that a supernatant in one of said chambers transfers into another of said chambers by centrifugal transferring.

4. Apparatus according to claim 1 wherein said means for locking, when activated to a first position, locks said container such that a supernatant in said first chamber drains into said second chamber by gravity draining and, when activated to a second position, locks said container such that a supernatant in said second chamber transfers into said first chamber by centrifugal transferring.

5. Apparatus according to claim 1 wherein said locking means comprises a movable plate and means for controlling the position of said plate.

6. Apparatus according to claim 5 wherein means for controlling is electrical.

7. Apparatus according to claim 6 wherein said means for controlling is magnetic.

8. Apparatus according to claim 1 further comprising means for controlling said means for locking and said means for rotating to provide automatic multiple decanting by activating said means for rotating for a predetermined period of time, activating said means for locking to allow a supernatant in said first chamber to transfer into said second chamber, activating said means for rotating a second time, and activating said means for locking a second time to allow a supernatant in said second chamber to transfer into said first chamber.

9. Apparatus according to claim 8 wherein said means for locking locks said container such that a supernatant in said first chamber transfers into said second chamber by gravity draining and locks said container such that a supernatant in said second chamber transfers into said first chamber by centrifugal transferring.

10. Apparatus according to claim 1 further comprising means for controlling the temperature of the contents of said second chamber.

11. Apparatus according to claim 10 wherein said means for controlling the temperature is capable of freezing said contents for cryoprecipitation.

12. Apparatus for separation of a precipitate from a liquid comprising a unitary container having first and second adjacent chambers, wherein said first chamber is located with respect to said second chamber such that a first supernatant in said first chamber drains by gravity into said second chamber when said first and second chambers are held in a first orientation and a second supernatant in said second chamber transfers from said second chamber into said first chamber by centrifugal transferring when said first and second chambers are held in a second orientation and subjected to centrifugation.

13. Apparatus according to claim 12 wherein said first and second chambers are joined by a wall that forms a fluid flow path between said first and second chambers.

14. Apparatus according to claim 13 further comprising divider means for dividing said first chamber into two [pads] parts, said divider means being located near the expected location of the interface between said precipitate and said liquid.

15. Apparatus according to claim 14 wherein said divider means includes a periphery having at least one groove therein for allowing fluid communication between said two parts.

16. Apparatus according to claim 12 further comprising a covering on said first and second chambers for preventing spillage of the contents of said chambers while allowing a syringe to inject fluids into or remove fluids from said chambers.

17. Apparatus according to claim 16 wherein said covering includes access port means for each of said chambers for allowing a fluid to be introduced into a chamber and means for sealing said access port means until opened to allow said fluid to pass.

18. Apparatus according to claim 17 wherein at least one of said chambers includes a hollow tube aligned with a said access port for conducting said fluid into said at least one of said chambers.

19. Apparatus according to claim 18 further comprising air vent means for allowing air in said container to exit from said container.

20. Apparatus according to claim 12 in combination with a centrifuge for subjecting said liquid to centrifugation, locking said chambers in said first orientation to allow said first supernatant to drain into said second chamber, and locking said chambers in said second orientation while rotating said chambers to provide said centrifugal transferring.

21. A centrifuge comprising a first chamber for receiving a fluid substance and a second chamber for receiving a fluid substance, means for rotating said first and second chambers to subject said substances to centrifugation, and means for locking said chambers in first predetermined positions and for locking said chambers in second predetermined positions, means for transferring a supernatant in said first chamber into said second chamber by gravity when said chambers are in said first predetermined positions and for transferring a supernatant in said second chamber to said first chamber by centrifugal transfer when said chambers are in said second predetermined positions.

22. A system for treating physiological products, comprising:

a centrifuge;

a container having at least a first chamber and a second chamber, wherein each of the first and second chambers have a top portion, a bottom portion and a set of walls, wherein the top portions of the first chamber and second chamber are connected by a bridge for transferring fluid therebetween; and

a holder assembly attached to the centrifuge and effective to removably receive the container, wherein the holder assembly is effective to position the container in one or more predetermined positions.

23. The system of claim 22, wherein the chambers include removable lid portions, thereby forming a closed container.

24. The system of claim 23 wherein at least one of the chambers includes an access port for transference of a liquid.

25. A container comprising:

at least a first chamber having a top portion, a bottom portion and a first set of walls;

a second chamber having a second top portion, a second bottom portion and a second set of walls;

and a bridge connecting the top portion of the first chamber and the top portion of the second chamber, such that a substance can be transferred from the first chamber to the second chamber while the container is positioned at a predetermined angle.

26. The container of claim 25, wherein the chambers include a removable lid portion.

27. The container of claim 26, wherein at least one of the chambers includes an access port for transference of a liquid.

28. A system for treating physiological products and maintaining sterility of said products during said treating comprising:

a container having a plurality of closed, sterile fluid-receiving chambers, a bridge forming a fluid path

allowing fluid communication between a first of said chambers and a second of said chambers when said container is in a predetermined orientation, and at least one access port allowing access to at least one of said chambers to maintain sterility, and

a centrifuge having a holder removably receiving said container and allowing said container to assume a first orientation wherein a physiological product in one of said chambers is subjected to centrifugation and said predetermined orientation wherein fluid in said first of said chambers flows along said fluid path to said second of said chambers.

29. A system according to claim 28 wherein said holder comprises a frame pivotally mounted to a centrifuge rotor.

30. A system according to claim 28 further comprising a movable locking plate that is movable between free and locking positions, wherein said plate allows said container to assume said first orientation when in said free position and holds said container in said predetermined position when in said locking position.

31. A system according to claim 30 further comprising an electromagnet for moving said locking plate to one of said locking and free positions.

32. A system according to claim 28 wherein said holder comprises a frame pivotally mounted to a centrifuge rotor, and further comprising a movable locking plate that is movable between free and locking positions, wherein said plate engages said frame to allow said container to assume said first orientation when in said free position and to hold said container in said predetermined position when in said locking position

33. A container comprising a base forming a plurality of sterile chambers, each of said chambers having a bottom and a top, a bridge connecting at least two of said chambers and arranged to provide a sterile fluid channel from a first of said at least two sterile chambers to a second of said at least two sterile chambers when said container is in a predetermined orientation, a lid closing said top of each of said plurality of chambers, and access ports that provide access to the chambers while maintaining sterility.

34. A container according to claim 33 wherein said plurality of sterile chambers and said bridge comprise a molded base part.

35. A container according to claim 34 wherein said container is substantially rigid.

36. A container according to claim 33 further comprising a separation disk in one of said chambers.

37. A container according to claim 33 wherein said plurality of chambers comprise first and second adjacent chambers having adjacent sidewalls and said bridge is formed at the tops of said adjacent sidewalls.